SPECTROMETRY OF 4 VESTA NEAR 505 nm PYROXENE ABSORTION BAND. L. F. Golubeva and D. I. Shestopalov, Shemakha Astrophysical Observatory, Shemakha 373243, Azerbaijan.

Sixteen spectra of Vesta were obtained on November 23/24, 1990 using the 2-m telescope at the Shemakha Observatory with the Cassegrain scanning spectrophotometer. HD 21364 situated in the sky within 30′ of the asteroid was used as standard star. The energy distribution in the spectrum of this star was obtained by us formerly with the same equipment in respect of standards β Tau and β Ari from catalogue [1]. Spectra of the star and the asteroid were scanned with variable step: 4.9 nm in 400–500 nm and 590–720 nm ranges and 0.98 nm in 500–590 nm range. The wavelength calibration of the spectra was made on Bal - mer lines, telluric water vapor, and oxygen bands. Summary observation time of Vesta was 4h 43m. Normalized spectral reflectance coefficients of Vesta were calculated regarding the Sun [2]. The processing of asteroid spectra did not differ from method described formerly [3]. Table 1 lists information about numbers of asteroid spectra and rotation phase corresponding to the middle of time interval (~10 min.) during which one spectrum was measured. Parts of spectral curves in the region of the 505-nm band of Fe^{2+} ions in pyroxene are shown in Fig. 1.

Residual intensities of this band in respect to the local continuum drawn on its wings are shown too. Figures 2a, b show the center position of the 505-nm band (CP) in Vesta spectra as a function of rotation phase. The totality of V magnitude estimates which were calculated on asteroid spectra have been combined with Vesta lightcurve [5] when maximum coefficient of run correlation was equal 0.8 (Fig. 2c. It is seen now that maximum value of CP occurs near minimum of the asteroid lightcurve. Accept that the ecliptic longitude and latitude of Vesta north pole are 326° and 53° respectively [4]. Then during our observations the latitude of sub-Earth point in planetocentric coordinates was +4.2°.

Statistical significance of the relationship on Fig. 2b have been verified with two-tail Student test. The hypothesis on equality of expectations for minimum and maximum of CP was examined. The probability of type I error was equal 12%. Hence, the conclusion about outline of a tendency to the change of CP with rotation phase will be true. A reliability of the result can be raised by the increase of spectral and time resolution.

References: [1] Kharitonov A. V. et al. (1978) in *Summary Spectrophoto. Catalogue of Stars.* Alma-Ata, Nauka (in Russian). [2] Neff J. C. et al. (1984) *Icarus, 60*, 221. [3] Shestopalov D. I. et al. (1990) *Astron. Vestn., 24*, 232 (in Russian). [4] Aksenov A. N. et al. (1987) *Sov. Astron. Lett., 13*, 616 (in Russian). [4] Drummond J. et al. (1988) *Icarus, 73*, 1.

TABLE 1.

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Sp:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
F:	0.0	.03	.07	.10	.22	.25	.28	.32	.35	.55	.58	.61	.64	.67	.85	.88

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F = 0.0 on November 23. 7757UT, 1990.

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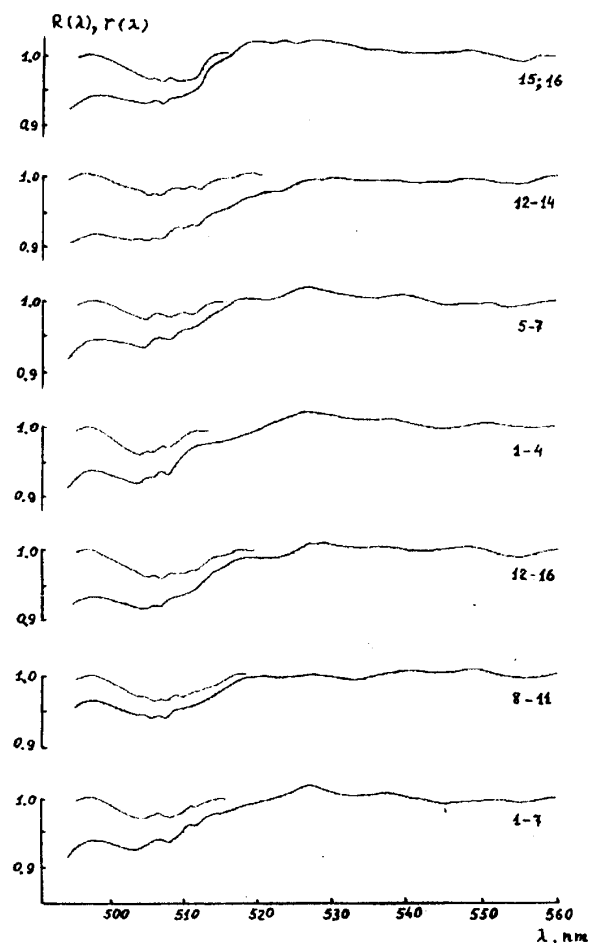
Fig. 1. The normalized spectral reflectance coefficients (R) of Vesta near 505-nm absorption band (unit at 560 nm) and residual intensities of this band (r). Every spectral curve represents an average of the separate spectra numbers given in Table 1. Relative error of the mean for discrete measurements in average spectra lies within 0.2–2.3%.
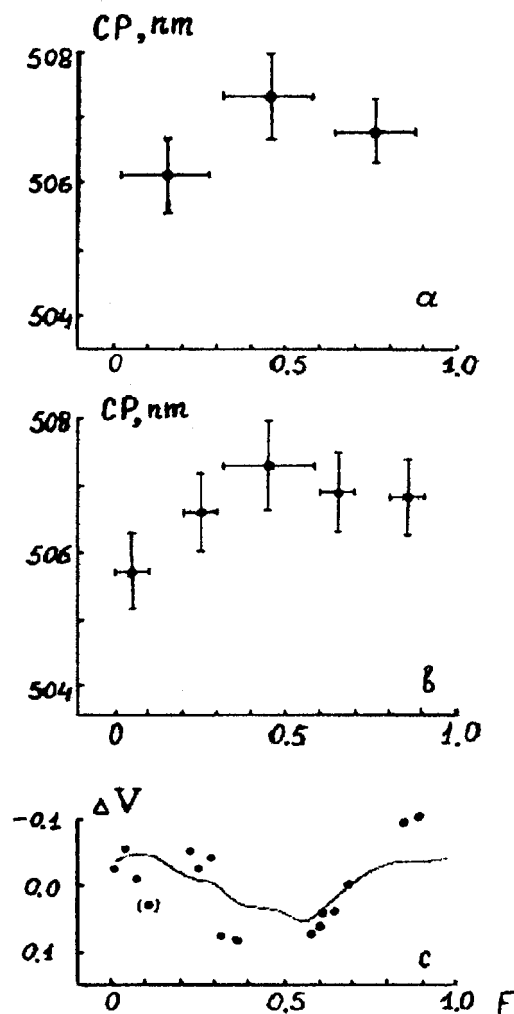
Fig 2. **(a)** Center position of 505-nm band are plotted vs. rotation phase of Vesta for spectra 1–7, 8–11, and 12–16; **(b)** The same for spectra 1–4, 5–7, 8–11, 12–14, and 15–16; **(c)** Combination of magnitudes V from spectral data with Vesta lightcurve.